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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,287	12/20/2005	Georg Fehrenbacher	2693-000016/US/NP	1653

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EXAMINER
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GREEN, YARA B

ART UNIT	PAPER NUMBER
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2884

MAIL DATE	DELIVERY MODE
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10/09/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/561,287	<b>Applicant(s)</b> FEHRENBACHER, GEORG	
	<b>Examiner</b> Yara B. Green	<b>Art Unit</b> 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____  |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :12/20/2005, 5/5/2006, 4/17/2007.

## **DETAILED ACTION**

### ***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

### ***Information Disclosure Statement***

2. The information disclosure statement filed December 20, 2005 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Claim Objections***

3. Claim 8 is objected to because of the following informalities: The claim does not terminate in a period (see MPEP 608.01(m)). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 9-11, 14, 20-21, and 23-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. Claims 9, 10, 11, 20, 21, 23, and 24 recite the limitations "layers" or "converter layers". There is insufficient antecedent basis for this limitation in the claim.
7. Claim 14 recites the limitation "Li atoms and/or B atoms and/or N atoms". There is insufficient antecedent basis for this limitation in the claim.
8. Regarding claim 17, the phrase "preferably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

### *Drawings*

9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: element 11 in Figure 4. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

10. The disclosure is objected to because of the following informalities: There is an error in the figure element number in page 6, paragraph 2. Dosimeter **5** should be dosimeter **1**, as indicated in the drawings.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. **Claims 1, 2, 4, 6, 16, and 18** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kitaguchi et al. (US Patent No. 5,321,269; published June 14, 1994).

Re **claim 1**, Kitaguchi et al. disclose a dosimeter for detecting high-energy neutron radiation comprising:

a neutron converter (col. 13, lines 24-27);

a detection element (col. 13, lines 37-41);

wherein the neutron converter comprises metal atoms which convert the energy of the neutrons to be detected into protons, alpha particles, and other charged nuclei in a suitable energy range so that they are detectable (col. 9, lines 40-45).

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Re **claim 2**, Kitaguchi et al. disclose a dosimeter from claim 1, wherein the metal atoms of the neutron converter have an atomic number of  $Z > 15$ , preferable  $Z > 20$  (col. 13, lines 26-28).

Re **claim 4**, Kitaguchi et al. disclose a dosimeter from claim 1, wherein the metal atoms of the neutron converter are stable in the sense of radioactivity (col. 9, lines 40-45).

Re **claim 6**, Kitaguchi et al. disclose a dosimeter from claim 1, wherein the neutron converter comprises metal atoms of alloys (col. 9, lines 40-45).

Re **claim 16**, Kitaguchi et al. disclose a dosimeter from claim 1, wherein the neutron converter has fields (N1, N2, N3) with different structures arranged spatially next to each other (col. 5, lines 34-40).

Re **claim 18**, Kitaguchi et al. disclose a dosimeter from claim 1, wherein a number of dosimeters can be arranged on a phantom in order to carry out a directional measurement (col. 7, lines 26-31).

13. **Claims 1, 3, and 4** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Justus et al. (US Patent No. 5,656,815; published August 12, 1997).

Re **claim 1**, Justus et al. disclose a dosimeter for detecting high-energy neutron radiation comprising:

a neutron converter (col. 2, lines 33-38, col. 4 lines 54-65);

a detection element (col. 8, lines 12-20);

wherein the neutron converter comprises metal atoms which convert the energy of the neutrons to be detected into protons, alpha particles, and other charged nuclei in a suitable energy range so that they are detectable (col. 4, lines 54-65; lines 34-38).

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Re **claim 3**, Justus et al. disclose the dosimeter from claim 1, wherein the neutron converter comprises titanium, chrome, vanadium, iron, copper, wolfram, and/or lead atoms (col. 4, lines 54-65; col. 5, lines 8-11).

Re **claim 4**, Justus et al. disclose a dosimeter from claim 1, wherein the metal atoms of the neutron converter are stable in the sense of radioactivity (col. 4, lines 54-65; col. 5, lines 8-11).

14. **Claims 1 and 10** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Morton (US Patent No. 5,693,947; published December 2, 1997).

Re **claim 1**, Morton discloses a dosimeter for detecting high-energy neutron radiation comprising:

a neutron converter (col. 8, lines 58-64);

a detection element (col. 2, lines 51-67);

wherein the neutron converter comprises metal atoms which convert the energy of the neutrons to be detected into protons, alpha particles, and other charged nuclei in a suitable energy range so that they are detectable (col. 11, lines 1-4).

Re **claim 10** Morton discloses a dosimeter from claim 1, wherein at least one of the layers with metal atoms is configured as metal foil, preferably as rolled metal foil, or polymer foil sputtered with metal (col. 11, lines 1-4).

15. **Claims 1 and 22** is rejected under 35 U.S.C. 102(b) as being anticipated by Barthe et al. (US Patent No. 5,406,086).

Re **claim 1**, Barthe et al. disclose a dosimeter for detecting high-energy neutron radiation comprising:



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a neutron converter (col. 2, lines 32-37);

a detection element (col. 2, lines 22-32);

wherein the neutron converter comprises metal atoms which convert the energy of the neutrons to be detected into protons, alpha particles, and other charged nuclei in a suitable energy range so that they are detectable (col. 2, lines 31-40).

Re **claim 22**, Barthe et al. disclose a dosimeter from claim 1, wherein provision is made for a photon dosimeter (col. 2, lines 62-68).

16. **Claims 1, 5, 7-8, 11, and 12** are rejected under 35 U.S.C. 102(a) as being anticipated by McGregor et al. ("Design considerations for thin film coated semiconductor thermal neutron detectors – I: basics regarding alpha particle emitting neutron reactive films", published November 22, 2002).

Re **claim 1**, McGregor et al. disclose a dosimeter for detecting high-energy neutron radiation comprising:

a neutron converter (pg. 290, sect. 5.2, paragraph 1; figure 25);

a detection element (pg. 290, sect. 5.2, paragraph 1; figure 25);

wherein the neutron converter comprises metal atoms which convert the energy of the neutrons to be detected into protons, alpha particles, and other charged nuclei in a suitable energy range so that they are detectable (col. 9, lines 40-45).

Re **claim 5**, McGregor et al. disclose a dosimeter from claim 1, wherein the neutron converter contains metal atoms with different atomic numbers (pg. 290, sect. 5.2, paragraph 1; figure 25).

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Re **claim 7**, McGregor et al. disclose a dosimeter from claim 1, wherein the neutron converter comprises at least two layers with metal atoms of different atomic numbers (pg. 290, sect. 5.2, paragraph 1; figure 25).

Re **claim 8**, McGregor et al. disclose a dosimeter from claim 1, wherein the neutron converter comprises layers with metal atoms where essentially only metal atoms with a specific atomic number are included in each layer (pg. 290, sect. 5.2, paragraph 1; figure 25).

Re **claim 11**, McGregor et al. disclose a dosimeter from claim 1, wherein the sequence of layers with metal atoms of different atomic numbers is matched to the energy spectrum of the neutron radiation (pg. 290, sect. 5.2, figure 25).

Re **claim 12**, McGregor et al. disclose a dosimeter from claim 1, wherein the neutron converter viewed from the side of the dosimeter facing the neutron radiation, has Li atoms and/or B atoms and/or N atoms in front of the detection element – preferably in a thin layer (pg. 290, sect. 5.2, figure 25).

### ***Claim Rejections - 35 USC § 103***

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. **Claim 9** is rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over McGregor et al. (“Design considerations for thin film coated semiconductor thermal neutron detectors – I: basics regarding alpha particle emitting neutron reactive films”, published November 22, 2002).

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McGregor disclose a dosimeter from claim 1, in which the neutron converter comprises layers with metal atoms that can be ordered in either ascending or descending atomic numbers (towards the detector). McGregor concedes that arranging the layers in ascending atomic orders will compromise efficiency. However, if efficiency is not an issue of concern and does not take a priority in design choice, one of ordinary skill in the art would be motivated to arrange the converter layers in descending atomic order.

19. **Claims 13, 23, and 24** rejected under 35 U.S.C. 103(a) as being unpatentable over Kitaguchi et al. (US Patent No. 5,321,269; published June 14, 1994) as applied to claim 1, and further in view of Burgkhart et al. (US Patent No. 4,492,872; published January 8, 1985).

Kitaguchi et al. disclose the limitations of claim 1, as mentioned previously, but is silent as to the casing of the neutron dosimeter, which therefore allows that which is well known in the art to be implemented. In the same field of endeavour of neutron dosimeters, Burgkhart et al. disclose a dosimeter wherein at least two dosimeter elements with different metal atoms for measuring energy and/or angular distribution can be housed in a casing (col. 3, lines 29-38; col. 4, lines 28-34; col. 1, lines 60-64) that has front, back and side walls (col. 3, lines 29-38). Furthermore, Burgkhart et al. disclose a casing in which the side walls contain borium and/or cadmium and/or nitrogen and/or lithium (col. 3, lines 10-18). One of ordinary skill in the art would have been motivated to encase the dosimeter of Kitaguchi et al. as taught by Burgkhart et al. so that it can be usable universally for different dosimeter systems.

20. **Claims 14 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over McGregor et al. ("Design considerations for thin film coated semiconductor thermal

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neutron detectors – I: basics regarding alpha particle emitting neutron reactive films”, published November 22, 2002) in view Barthe et al. (US Patent No. 5,406,086; published April 11, 1995)

McGregor et al. discloses the limitations of claim 1, as mentioned previously, but does not disclose including a hydrogenous polymer between the metal atoms. In the same field of endeavour, Barthe et al. disclose inserting a hydrogenous polymer (polyethylene) in a neutron dosimeter (col. 2, lines 31-36) as hydrogenous polymers are well known to increase detection of fast neutrons. One would have been motivated to insert a hydrogenous polymer between the atoms, and more specifically, between the first layer of metal atoms and the third layer of Li, B, and/or N atoms as disclosed by McGregor et al. in order to increase the detection of fast neutrons as disclosed by Barthe et al.

21. **Claim 17** is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kitaguchi et al. (US Patent No. 5,321,269; published June 14, 1994).

Kitaguchi et al. disclose a variety of geometrical arrangements of the dosimeters, (col. 15, lines 27-40; Figs. 18-20) including a cube and a cylinder; therefore, it would have been obvious to try other geometries in order to perform desired dosage measurements. One of ordinary skill in the art would have been motivated to try a cone shape arrangement in addition to the other geometries disclosed by Kitaguchi et al. so to carry out the desired local dosage measurement.

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22. **Claims 19-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitaguchi et al. (US Patent No. 5,321,269; published June 14, 1994) as applied to claim 1, and further in view of Tawil et al. (US Patent No. 5,572,027; published November 5, 1996).

Kitaguchi et al. disclose the limitations of claim 1, as mentioned previously, and recognize the utility of multiple materials for detecting a broad range of neutron radiation with active detection elements. Kitaguchi et al., however, does not disclose two types of detectors. In the same field of endeavour, Tawil et al. disclose a dosimeter, wherein the detection element comprises at least one passive element and/or at least one active element in order to provide more accurate exposure measurements (col. 3, lines 59-61; col. 4, lines 4-8). More specifically, Tawil et al. disclose the passive element comprises organic high-molecular polymer, preferable polycarbonate or cellulose nitrate and/or an inorganic crystal and/or mineral, such as a thermoluminescent crystal (LiF and/or inorganic glasses and/or an inorganic crystal) (col. 1, lines 64-60). Tawil et al. further disclose the dosimeter wherein the active element is a silicon semi-conductor (col. 1, lines 60-64). Therefore, it would have been obvious to one of ordinary skill in the art to implement both active and passive detection elements as taught by Tawil et al. in the dosimeter of Kitaguchi et al. in order to ensure accurate dosage measurements.

### ***Conclusion***

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kronenberg et al. (US Patent No. 6,654,435) disclose a dosimeter wherein the neutron converters having varying thicknesses to coincide with the desired energy ranges to be detected. Odom et al. (US Patent No. 6,566,657) disclose a neutron

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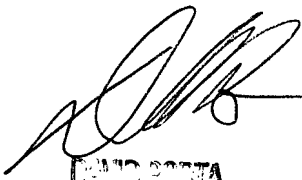
dosimeter with alternating hydrogenous polymer layers with conversion layers in order to increase fast neutron detection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yara B. Green whose telephone number is (571) 270-3035. The examiner can normally be reached on Monday - Thursday, 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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